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<b>(54) Title:</b> SURFACE FINISHING MACHINE			
<b>(57) Abstract</b> Disclosed is a surface finishing pad (59) having a dust extraction aperture (60). The pad may have multiple finishing areas (63) or a number of pads may be mounted to a mounting plate (48, 62) that is driven by orbital drive means. The dust extraction apertures align (60) with vacuum ports through which dust may be carried away from a surface undergoing finishing. The mounting plate (48) may have a plurality of channels (46) to direct dust to vacuum ports for extraction. The pad and the machine disclosed, which uses the pads, allows large areas to be finished without dust-clogging the pads.			

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## SURFACE FINISHING MACHINE

### FIELD OF THE INVENTION

The invention disclosed herein relates to a surface finishing machine. It also  
5 relates to surface finishing pads for use with the surface finishing machine. The  
surface finishing machine may be used for sanding, burnishing, polishing and the  
like of surfaces such as timber, stone, acrylic and the like. The surface may be,  
amongst others, bench tops and floors. Without intending to limit the invention  
the application of finishing a solid surface, that is, an acrylic bench top will be  
10 used as explanatory of the invention. It will be appreciated that the invention is  
applicable to other applications and other surfaces.

15 The processes of sanding, burnishing, polishing and the like of surfaces is  
collectively referred herein as "surface finishing". In a similar manner a pad for  
use during surface finishing, such as a sanding pad, will generically be referred to  
as a "surface finishing" pad.

### BACKGROUND OF THE INVENTION

Known surface finishing machines are random orbital rotating machines which  
typically utilise a disc. The disc or surface finishing pad may be a sanding disc, a  
20 microfine finishing disc, or buffing disc depending upon the particular  
application. For sanding and micro finishing large diameter discs have been tried  
but have tended to be unusable because of clogging with dust. Accordingly, the  
largest known discs are about 203 mm in diameter which seem to be relatively  
unaffected by clogging. However, these discs mean that the area processed at any  
time is relatively small and so the time taken to process a surface is relatively  
25 long. Further, the use of these discs can lead to an uneven surface unless extreme  
care and thus time are taken. Also, it is very difficult to use these discs without  
scuffing the surface which leads to extra time being spent repairing the surface.

It is also known for surface finishing machines to have a dust collection system.  
These have essentially a chassis about a mounted disc about which a partial  
30 vacuum is created for conducting dust to a collection vessel.

It is also known that finishing pads may take shapes other than circular or disc  
like.

- It is a proposed object of this invention to provide a surface finishing pad with multiple finishing areas, a surface finishing pad with an aperture therethrough for dust extraction, a mounting plate with multiple mounting areas for mounting surface finishing pads, and a surface finishing machine to obviate or minimise at least one of the aforementioned problems, or at least provide the public with a useful choice.

#### SUMMARY OF THE INVENTION

The invention may be said to reside, not necessarily in the broadest or only form, in a surface finishing pad adapted for mounting to a mounting plate, the surface finishing pad including a dust extraction aperture therethrough and said dust extraction aperture being adapted to align with a vacuum port of a mounting plate.

In a preferred form the surface finishing pad is a disc. In other forms the surface finishing pad may take other shapes such as rectangular.

The invention may also be said to reside, again not necessarily in the broadest or only form, in surface finishing pad including at least one dust extraction aperture therethrough, a plurality of finishing areas proud of an intervening web, the surface finishing pad being mountable to a mounting plate having at least one vacuum port with which the dust extraction aperture or dust extraction apertures are adapted to align, and the surface finishing pad being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the dust extraction aperture or dust extraction apertures by vacuum dust extraction means.

In one form the surface finishing pad is circular and adapted to be mountable to a mounting plate driven by a random orbital means.

In another form the dust extraction aperture or at least one of the dust extraction apertures is within the web. In yet another form the dust extraction aperture or at least one of the dust extraction apertures is within a one of the finishing areas.

In one form the finishing areas are radially spaced about the centre of the surface finishing pad.

The invention may also be said to reside, again not necessarily in the broadest or only form, in a mounting plate for a surface finishing machine including at least one vacuum port, a plurality of mounting areas proud of an intervening web and adapted to have mounted thereto surface finishing pads, and the mounting plate

being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum port or vacuum ports by vacuum dust extraction means.

According to one form, the mounting plate is disc like.

- 5 In another form the mounting areas are circular and adapted to receive mounted thereto surface finishing pads. These surface finishing pads or discs may take known forms.

In one form the mounting plate has therethrough a vacuum port within the web portion for communication with dust extraction means adapted to extract dust

- 10 from the web portion. In another form the mounting plate has therethrough a vacuum port within one of the mounting areas for communication with dust extraction means adapted to have mounted thereto a surface finishing pad with an aperture therethrough adapted to align with the vacuum port and thereby being adapted to extract dust from the vicinity of the said mounting area. In yet a  
15 further form, the mounting plate has channels within at least one of the mounting areas extending from the web portion and adapted to conduct dust from the vicinity of the said mounting area to the web portion for extraction therefrom.

In one form the mounting areas are radially spaced about the centre of the mounting plate.

- 20 The invention may also be said to reside in a surface finishing machine including either the before mentioned surface finishing pad or the before mentioned mounting plate and random orbital drive means adapted to drive the surface finishing pad or mounting plate.

In one form the machine includes vacuum port means and connection means

- 25 adapted to facilitate vacuum dust extraction.

#### BRIEF DESCRIPTION OF THE DRAWINGS

To assist in the understanding of the invention preferred embodiments will now be described with reference to the accompanying drawings:

- Figure 1 is a perspective sketch of a surface finishing machine;
- 30 Figure 2 is a sketch of a handle for the top of the machine shown in figure 1;

- Figure 3 is a perspective sketch in cut away form of the machine with motor not drawn;
- Figure 4 is a cross sectional sketch of the machine with the motor not drawn;
- 5 Figure 5 is a perspective sketch in cut away form of the chassis;
- Figure 6 is a disassembled view of the transmission train from motor boss to base plate;
- Figure 7 is a cross sectional view of the fibre board disc;
- Figure 8 is a sketch of a perspective view of the fibre board disc;
- 10 Figure 9 is a perspective sketch of the mounting plate;
- Figure 10 is a plan view of the mounting plate;
- Figure 11 is a line sketch of a perspective view of a mounting area;
- Figure 12 is a perspective sketch of a second embodiment of the mounting plate viewed from beneath;
- 15 Figure 13 is a perspective sketch of a third embodiment of the mounting plate viewed from beneath;
- Figure 14 is a sketch of the disassembled view of a second embodiment of a surface finishing machine;
- Figure 15 is a plan view sketch of a fibre board disc;
- 20 Figure 16 is a perspective view sketch of the fibre board disc shown in figure 15;
- Figure 17 is a sketch of the central peg shown in figure 15;
- Figure 18 is a plan view sketch of a mounting plate;
- Figure 19 is a side view sketch of the mounting plate shown in figure 18;
- 25 Figure 20 is a perspective view sketch of the mounting plate shown in figure 18;

- Figure 21 is a plan view sketch of a base plate including counter weights;
- Figure 22 is a perspective view sketch of the base plate shown in figure 21;
- 5 Figure 23 is a perspective sketch of a further embodiment of a surface finishing pad viewed from beneath;
- Figure 24 is a sketch of a mounting plate and a surface finishing pad with two pairs of vacuum ports and dust extraction apertures;
- 10 Figure 25 is a sketch of under view of a surface finishing machine having a generally rectilinear configuration;
- Figure 26 is a perspective sketch of a further embodiment of a surface finishing pad viewed from beneath; and,
- 15 Figure 27 is a perspective view sketch of a further embodiment of a mounting plate adapted to mount three surface finishing pads.

#### DETAILED DESCRIPTION OF THE INVENTION

It will be appreciated that the accompanying drawings are sketches and not engineering design drawings. The intention is to assist understanding of the 20 invention and so perspective or features may be distorted or omitted for clarity. Throughout the drawings the same reference numeral will be used to refer to the same or similar feature.

The surface finishing machine depicted in the figures is of configuration for finishing a bench top.

25 The machine (1) has a chassis (2) upon which is mounted a 550 W electric motor (3) which operates at 1450 rpm. Extending from the chassis is a side handle (4) with a vacuum connection (5) at one end for connection with a vacuum dust extraction system.

30 The side handle is tubular and provides a conduit from within and beneath the chassis to the vacuum system. The side handle is mounted by a mating flange (6) and bolts to the chassis. Whilst only one connection to the extraction system is

shown for this embodiment a number may be provided if desired. For example a plurality of radially spaced apertures within the chassis may be provided and connected by hosing to a single hose which leads to the external vacuum extraction system.

- 5 Further, for some applications such as buffing the external vacuum extraction system may, as a matter of preference be disconnected.

Also extending from the chassis are two legs (7 and 8) by which the machine may be rested in an upright configuration upon a flat surface thereby allowing access to the mounting plate for surface finishing pad changing.

- 10 The machine has an overall width of about 400 mm and can finish about a 360 mm wide portion of a surface at one time. The large width means that a surface can be finished more quickly than when using prior known machines. Further, the width reduces the tendency of unevenness in the finished surface so reducing the time needed to ensure levelness. The weight of the machine is about 25 Kg  
15 which means that the weight of the machine is sufficient to press the surface finishing pads against the surface for correct operation. There is no need for an operator to press the machine against the surface and therefore the risk of scuffing is significantly reduced.

- 20 The chassis is made of aluminium and is shaped to fit about and skirt the mounting plate and attached mechanism leaving the discs extending beyond the chassis. In this way the chassis forms a shroud that facilitates dust collection and extraction. Subtending from the lower rim of the chassis is a rubber skirt (9) which makes a partial seal with a surface during operation.

- 25 A variation to the just mentioned machine includes a top handle (10) which has a push button (11) on/off switch with which to control the operational state of the electric motor. It will be appreciated that the wiring is not shown but would take known forms apparent to a skilled addressee. The handle includes a moulded hand grip (12) made of resilient material to reduce vibration transmitted to an operator. The top handle is mounted to the top of the motor by arcuate flanges  
30 (13 and 14) which mount to the cylindrical side of the motor.

Within the chassis is a mounting plate (15) which is mounted to a foam rubber disc (16) which in turn is mounted to a fibre board disc (17). The rubber disc is about 7 mm thick and provides a resilient backing for the mounting plate whilst the fibre board disc is about 9 mm thick and provides a rigid support therefor.

The fibre board disc is mounted to a base plate (18) of steel the diameter of which is less than that of the fibre board disc to reduce overall machine weight. The fibre board disc acts to extend the diameter of the base plate without adding significant weight to the machine.

- 5 The base plate is mounted by bearing centre (19), bearing (20), bearing retainer (21), spacer (22) to main plate (23). The base plate, bearing centre, bearing, bearing retainer and spacer are offset from the centre of the main plate by 10 mm to one side. To the lower surface of the main plate is mounted a crescent shaped counter weight (24), of mass and dimensions to counter balance the offset
- 10 suspended assembly of base plate and mounting plate and associated parts. The main plate is mounted to the rotor of the motor by boss (25).

Upon the upper surface of the fibre board disc proximal to its perimeter is an annular ring (26) of urethane which substantially acts as a seal with the chassis. The partial vacuum for dust extraction is created within the ring.

- 15 From the above it will be appreciated that the electric motor drives the main plate at 1450 rpm under normal conditions. The offset mounting of the base plate means that it and its suspended parts orbit the main plate by an eccentric motion of 20 mm from circular. This motion together with the bearing means that the base plate and the suspended parts rotate in a random orbital manner depending
- 20 upon the surface and experienced load. This arrangement effects an orbital drive means for the mounting plate.

The mounting plate, fibre board disc and rubber disc have aligned apertures therethrough which form vacuum ports (two shown as 27 and 28). These are within the ring of the chassis and communicate with the vacuum extraction system.

- 25 The mounting plate is made of urethane, approximately 6 mm thick and is resiliently flexible. It has four radially spaced finishing pad mounting areas (one shown as 29) spaced about its centre each 180 mm in diameter. The pad mounting areas are circular in shape and adapted to have mounted thereto by use of hook and loop means fastener, as commonly known under the trade mark VELCRO, surface finishing pads. The pad mounting areas are proud of the mounting plate by 3 mm interspaced by web portions (30) which are approximately 3 mm thick. Within the mounting areas are channels (one shown as 31) 1 mm deep between the vacuum port and the web portion for conducting

dust either to the vacuum port through the mounting areas or to the intervening web portion and thence to a vacuum port therein. The vacuum port within the mounting areas are in this embodiment proximal to the perimeter of the mounting plate where centrifugal force will tend to move dust. The channels are

- 5 approximately 10 mm wide and are arcuate in profile. Other profiles and widths may be used as desired whilst meeting the object of clearing the dust.

A second embodiment of the mounting plate is illustrated in figure 12. This mounting plate is of similar construction as that shown in figure 9, except that no channels are provided. The vacuum port within the mounting area is positioned

- 10 further away from the periphery of the mounting area, than that shown for the first embodiment. This is preferred to alleviate the problem of the sanding discs lifting at about that area as a result of the lack of sufficient surface adhesion. This embodiment of the mounting plate is useful where sanding discs are to be attached to the mounting plate by the use of an adhesive rather than VELCRO  
15 (trade mark). Sanding discs used in the first embodiment tend to conform to the shape of the mounting area under the influence of the vacuum, however certain sanding pads currently on the market are particularly rigid and will not do so. The second embodiment of the mounting plate can then be used.

A third embodiment of the mounting plate is illustrated in figure 13. This

- 20 mounting plate is very similar in construction to the mounting plate shown in figure 9. The primary differences are that there are less channels, and that the vacuum port within the pad mounting area is positioned further away from the periphery of the pad mounting area. These modifications are preferred where there are difficulties in providing sufficient adhesion for the pad to stay on the  
25 mounting plate during use.

The mounting plate is secured to the fibre board disc by means of radially spaced bolts. This mounting is not shown in all figures but takes a form apparent to a skilled addressee. Discussion concerning another embodiment of a surface finishing machine below mentions and depicts the bolts. In this first embodiment

- 30 the foam rubber disc has appropriate apertures and is secured in place by the bolts securing the mounting plate to the fibre board disc.

To the mounting areas may be mounted modified standard 180 mm (6 inch) discs that are commonly available within Australia and in at least some overseas countries. These discs, it is intended, will be available with an aperture

- 35 therethrough to align with the vacuum port within the mounting area.

Alternatively, it is a relatively simple matter to cut a suitable aperture through a prior known disc. Such apertures are not required with polishing or buffing discs where dust is not created to any serious extent.

The second embodiment of the surface finishing machine will now be discussed.

- 5 The machine is similar to the first and also includes an electric motor, suitable controls, handles and vacuum extraction system. The differences lie within the chassis and these will be discussed.

To the rotor of the motor is mounted a boss (32). There is a spacer (33), bearing retainer (34), bearing (35), bearing centre (36) and main plate (37) which

- 10 collectively mount the main plate to the boss using bolts (one shown as 38). This is generally as previously described.

The main plate, again made of steel, takes a different shape being best seen in figure 21 and is not a circular disc. The weight of the main plate is accordingly reduced. To the main plate is mounted by bolts two counter weights (39 and 40)

- 15 each being fasten to opposite sides of the main plate. A further counteracting weight is provided by counter balance (41) which is also bolted to the main plate. It will be appreciated that the function of the main plate is as before and is part of an orbital drive means.

- 20 Mounted by bolts to the main plate is a base plate (42) which again is made of steel. The base plate is essentially as previously described and is mounted off centre with respect to the main plate to effect the random orbital motion.

- 25 Mounted by bolts to the base plate is a fibre board disc (43) which in plan view is not circular. Its shape is best seen in figure 15. It is 9 mm thick and quite rigid so providing a firm backing to a mounting plate later to be described. Glued to the fibre board disc are four mounting area pegs (one shown as 44) and a central peg (45) all made of P.V.C. cylindrical tubing approximately 33 mm in diameter. These pegs provided registering means for the mounting plate and conduits for the vacuum ports through which dust may be extracted.

- 30 The central peg has an external circumferential groove (46) of approximately 0.5 mm depth and 2 mm width. This groove is located so that it is approximately level with but slightly spaced from the surface (47) from which the pegs project. This groove forms part of a fastening means for securing the mounting plate to the fibre board disc.

The mounting plate (48) is of layer construction having a first layer (49) of urethane approximately 6 mm thick, a second layer (50) of foam rubber of approximately 9 mm thickness, and a final layer being a P.V.C. backing plate (51) of approximately 1 mm thickness. These layers are glued together to make a

5 laminated structure.

The foam rubber layer is equivalent to the foam rubber disc of the first embodiment. Likewise with the first layer and the mounting plate of the first embodiment. It will be appreciated that the laminated construction simplifies assembly and disassembly but functionally is the same as the separate

10 components of the first embodiment.

All the layers of the mounting plate include holes to receive the pegs projecting from the fibre board disc. The hole of the backing plate to receive the central peg is slightly smaller than the diameter of the peg, approximately 32 mm compared with approximately 33 mm, so forming a circular detent (52). The backing plate

15 is sufficiently resilient to flex under manual pressure of fitting the mounting plate to allow the central peg to be received and when against the fibre board disc the backing plate clicks into the groove. This prevents unintentional separation of the fibre board disc and the mounting plate whilst allowing easy fitting. The four mounting area pegs register the mounting plate relative to the fibre board disc.

20 The backing plate is also flexible enough to allow for intentional removal of the mounting plate by an operator.

Being able to change the mounting plate allows a number of mounting plates to be prepared and interchanged as required before requiring new surface finishing pads to be fitted. Also, changing mounting plates permits changing from one

25 grade of finishing pad to another including going from sanding to buffing.

Through the mounting plate are vacuum ports (53, 54, 55, 56 and 57) defined by the pegs. There are also four mounting areas (one shown as 58) to which a surface finishing pad (one shown as 59) can be mounted.

30 Depending upon the application and whether dust is created, the surface finishing pad has a dust extraction aperture (60). The dust extraction aperture aligns with the vacuum port within the respective mounting area. The surface finishing pad may be a modified previously known and commercially available surface finishing pad, the modification being the cutting of the dust extraction aperture.

It will be appreciated that each mounting area (one shown as 61) of a mounting plate (62) and respective surface finishing pad (63) may have multiple aligned vacuum port (two shown as 64 and 65) and dust extraction apertures (two shown as 66 and 67) as illustrated in figure 24.

- 5 Whilst circular surface finishing pads have been described it will be appreciated that the arrangement may be altered to accept rectangular surface finishing pads (68). In this form the surface finishing machine has a chassis (69), fibre board disc and mounting plate (70) with a generally rectilinear configuration. This is illustrated in figure 25. The mounting areas (one shown as 71) has a vacuum port (one shown as 72) and the surface finishing pad may have a respective dust extraction aperture (73). Within the mounting plate are other vacuum ports through the web (74) interconnecting the mounting areas including rectangular ports (one shown as 75) between mounting areas.
- 10

It will be appreciated that due to currently available discs it is preferred to mount  
15 separate discs to the pad mounting areas. However, it is envisaged that discs may be made to cover the whole mounting plate whilst providing for operation as hereinbefore explained. Figure 23 illustrates a surface finishing pad (76) made of a suitable material such as urethane which would be mounted to a flat faced mounting plate through which suitable vacuum ports exist to align with the dust extraction apertures (two  
20 shown as 77 and 78). The surface finishing pad has four raised surface finishing areas (one shown as 79) upon which is the finishing material. The surface finishing pad may include channels (one shown as 80) which effect the same function as the previously described channels as illustrated in figure 26.

25 The mounting plate (81) illustrates the use of three mounting areas (one shown as 82) with vacuum ports (two shown as 83 and 84). Apart from the number of the mounting areas and appropriate changes to the number and location of vacuum ports this configuration is essentially the same a previously described.

It will also be appreciated that with an appropriate handle, longer than that previously illustrated, the machine just described can be converted to be used for floor operation  
30 with the operator being able to stand during use.

Other variations to the just described embodiment will be apparent to the skilled addressee including the provision of mounting areas spaced about two or more  
Substitute Sheet (Rule 26)(RO/AU)

rings about the centre of the mounting plate thereby allowing a greater area to be finished at any time.

- It will be appreciated that this disclosure is not intended to limit the invention to the preferred embodiment or details thereof. It is intended to give an overview of
- 5 the invention as conceived and other embodiments will be apparent to the skilled addressee all of which fall within the spirit of the invention.

## CLAIMS

1. A surface finishing pad adapted for mounting to a mounting plate, the surface finishing pad including a dust extraction aperture therethrough and said dust extraction aperture being adapted to align with a vacuum port of a mounting plate.  
5
2. A surface finishing pad as in claim 1 including more than one dust extraction aperture, each said dust extraction aperture being adapted to align with a respective vacuum port of a mounting plate.
3. A surface finishing pad as in either claim 1 or claim 2 wherein the surface finishing pad is a disc.  
10
4. A surface finishing pad as in claim 3 wherein the diameter of the surface finishing pad is less than or equal to 203 mm.
5. A surface finishing pad as in either claim 1 or claim 2 wherein the surface finishing pad is rectangular.
- 15 6. A surface finishing pad as in any one of the preceding claims including adhesive means adapted for adhering the surface finishing pad to a mounting plate.
7. A surface finishing pad as in any one of claims 1 to 5 inclusive including hook and loop means adapted for attaching the surface finishing pad to a  
20 mounting plate.
8. A surface finishing pad as in any one of the preceding claims adapted for sanding, burnishing or polishing of timber surfaces.
9. A surface finishing pad as in any one of claims 1 to 7 inclusive adapted for sanding, burnishing or polishing of stone surfaces.
- 25 10. A surface finishing pad as in any one of claims 1 to 7 inclusive adapted for sanding, burnishing or polishing of acrylic surfaces.
11. A surface finishing pad including at least one dust extraction aperture therethrough, a plurality of finishing areas proud of an intervening web, the surface finishing pad being mountable to a mounting plate having at least one  
30 vacuum port with which the dust extraction aperture or dust extraction apertures

are adapted to align, and the surface finishing pad being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the dust extraction aperture or dust extraction apertures by vacuum dust extraction means.

- 5      12. A surface finishing pad as in claim 11 wherein the dust extraction aperture or at least one of the dust extraction apertures is within the web.
13. A surface finishing pad as in claim 11 wherein the dust extraction aperture or at least one of the dust extraction apertures is within a one of the finishing areas.
- 10     14. A surface finishing pad as in any one of claims 11 to 13 inclusive being circular and adapted to be mountable to a mounting plate driven by a random orbital means.
15. A surface finishing pad as in any one of claims 11 to 14 inclusive wherein the centre of the surface finishing pad is part of the web.
- 15     16. A surface finishing pad as in any one of claims 11 to 15 inclusive wherein the finishing areas are radially spaced about the centre of the surface finishing pad.
17. A surface finishing pad as in claim 16 including at least three finishing areas.
- 20     18. A surface finishing pad as in claim 16 including four finishing areas.
19. A surface finishing pad as in any one of claims 15 to 18 inclusive including a plurality of dust extraction apertures, at least one dust extraction aperture being through the web and proximal to the centre of the surface finishing pad, and other dust extraction apertures being through the web and proximal to the periphery of the surface finishing pad.
- 25     20. A surface finishing pad as in any one of claims 15 to 19 inclusive including a plurality of dust extraction apertures, at least one dust extraction aperture being through each finishing area.
21. A surface finishing pad as in claim 20 wherein the finishing areas are circular and the dust extraction aperture of each finishing area being between the centre of the respective finishing area and the periphery of the respective finishing area distal the centre of the surface finishing pad.
- 30

## 15

22. A surface finishing pad as in any one of claims 11 to 20 inclusive wherein each finishing area has at least one channel therein adapted to direct dust to the dust extraction aperture or a one of the dust extraction apertures.
23. A surface finishing pad as in claim 21 wherein each finishing area has at 5 least one channel therein adapted to direct dust to the dust extraction aperture through the respective finishing area.
24. A surface finishing pad as in any one of claims 11 to 23 inclusive wherein the finishing areas are circular and of diameter less than or equal to 203 mm.
25. A surface finishing pad as in any one of claims 11 to 24 inclusive adapted 10 for sanding, burnishing or polishing of timber surfaces.
26. A surface finishing pad as in any one of claims 11 to 24 inclusive adapted for sanding, burnishing or polishing of stone surfaces.
27. A surface finishing pad as in any one of claims 11 to 24 inclusive adapted for sanding, burnishing or polishing of acrylic surfaces.
28. A mounting plate for a surface finishing machine including at least one 15 vacuum port, a plurality of mounting areas proud of an intervening web and adapted to have mounted thereto surface finishing pads, and the mounting plate being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum port or vacuum ports by vacuum dust extraction means.
29. A mounting plate as in claim 28 wherein the vacuum port or at least one of 20 the vacuum ports is within the web.
30. A mounting plate as in claim 28 wherein the vacuum port or at least one of the vacuum ports is within a one of the finishing areas.
31. A mounting plate as in any one of claims 28 to 30 inclusive being circular 25 and adapted to be driven by a random orbital means.
32. A mounting plate as in any one of claims 28 to 31 inclusive wherein the centre of the mounting plate is part of the web.
33. A mounting plate as in any one of claims 28 to 32 inclusive wherein the 30 finishing areas are radially spaced about the centre of the mounting plate.

34. A mounting plate as in claim 33 including at least three finishing areas.
35. A mounting plate as in claim 33 including four finishing areas.
36. A mounting plate as in any one of claims 32 to 35 inclusive including a plurality of vacuum ports, at least one vacuum port being through the web and proximal to the centre of the mounting plate, and other vacuum ports being through the web and proximal to the periphery of the mounting plate.  
5
37. A mounting plate as in any one of claims 32 to 36 inclusive including a plurality of vacuum ports, at least one vacuum port being through the web and proximal to the centre of the mounting plate, other vacuum ports being through the web and proximal to the periphery of the mounting plate, and the mounting plate having respective vacuum ports with which the vacuum ports are adapted to align.  
10
38. A mounting plate as in any one of claims 32 to 37 inclusive including a plurality of vacuum ports, at least one vacuum port being through each mounting area being adapted to align with a dust extraction aperture of a surface finishing pad.  
15
39. A mounting plate as in claim 38 wherein the mounting areas are circular and the vacuum port of each mounting area being between the centre of the respective mounting area and the periphery of the respective mounting area distal the centre of the mounting plate.  
20
40. A mounting plate as in any one of claims 28 to 38 inclusive wherein each mounting area has at least one channel therein adapted to direct dust to the vacuum port or a one of the vacuum ports.
41. A mounting plate as in claims 39 wherein each mounting area has at least one channel therein adapted to direct dust to the vacuum port through the respective mounting area.  
25
42. A mounting plate as in any one of claims 28 to 41 inclusive wherein the mounting areas are circular and of diameter less than or equal to 373 mm.
43. A mounting plate as in any one of claims 28 to 42 inclusive including hook and loop means adapted for attaching a surface finishing pad to the mounting plate.  
30

44. A mounting plate as in any one of claims 28 to 43 inclusive made from urethane.

45. A mounting plate as in any one of claims 28 to 43 inclusive comprising a plurality of layers between an external surface upon which the mounting areas lie and a rear surface, and the mounting plate including a first layer including the mounting areas made of urethane and a second layer of resilient material.

46. A mounting plate as in any one of claims 28 to 45 inclusive wherein the vacuum port or at least one of the vacuum ports fits over a hollow cylindrical dust extraction peg, the dust extraction peg having an external circumferential groove, and the mounting plate including a thin backing plate with a peg aperture of diameter slightly smaller than the external diameter of the peg and adapted to receive the dust extraction peg, and the thickness and resiliency of the backing plate being such that the mounting plate may be pushed onto and pulled off the dust extraction peg and when secured relative to the dust extraction peg the backing plate resides within the groove.

47. A surface finishing machine including the finishing surface finishing pad of any one of claims 11 to 27 inclusive and random orbital drive means adapted to drive the surface finishing pad.

48. A surface finishing machine including the mounting plate of any one of claims 28 to 46 and random orbital drive means adapted to drive the mounting plate.

49. A surface finishing machine as in either claim 47 or 48 including vacuum port means and connection means adapted to facilitate vacuum dust extraction.

50. A surface finishing machine as in claim 49 including dust collection means for the collection of the extracted dust.

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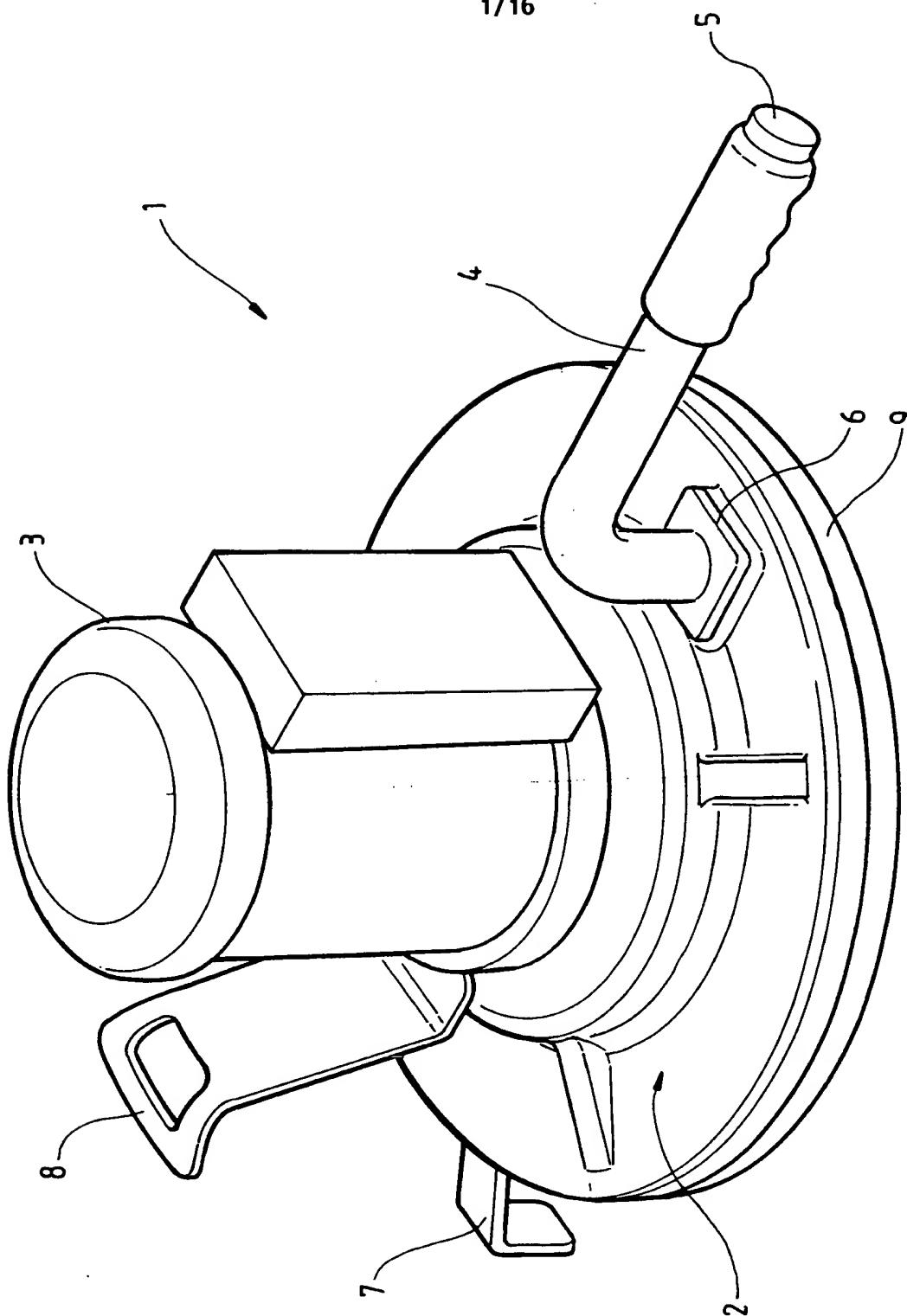


FIG 1

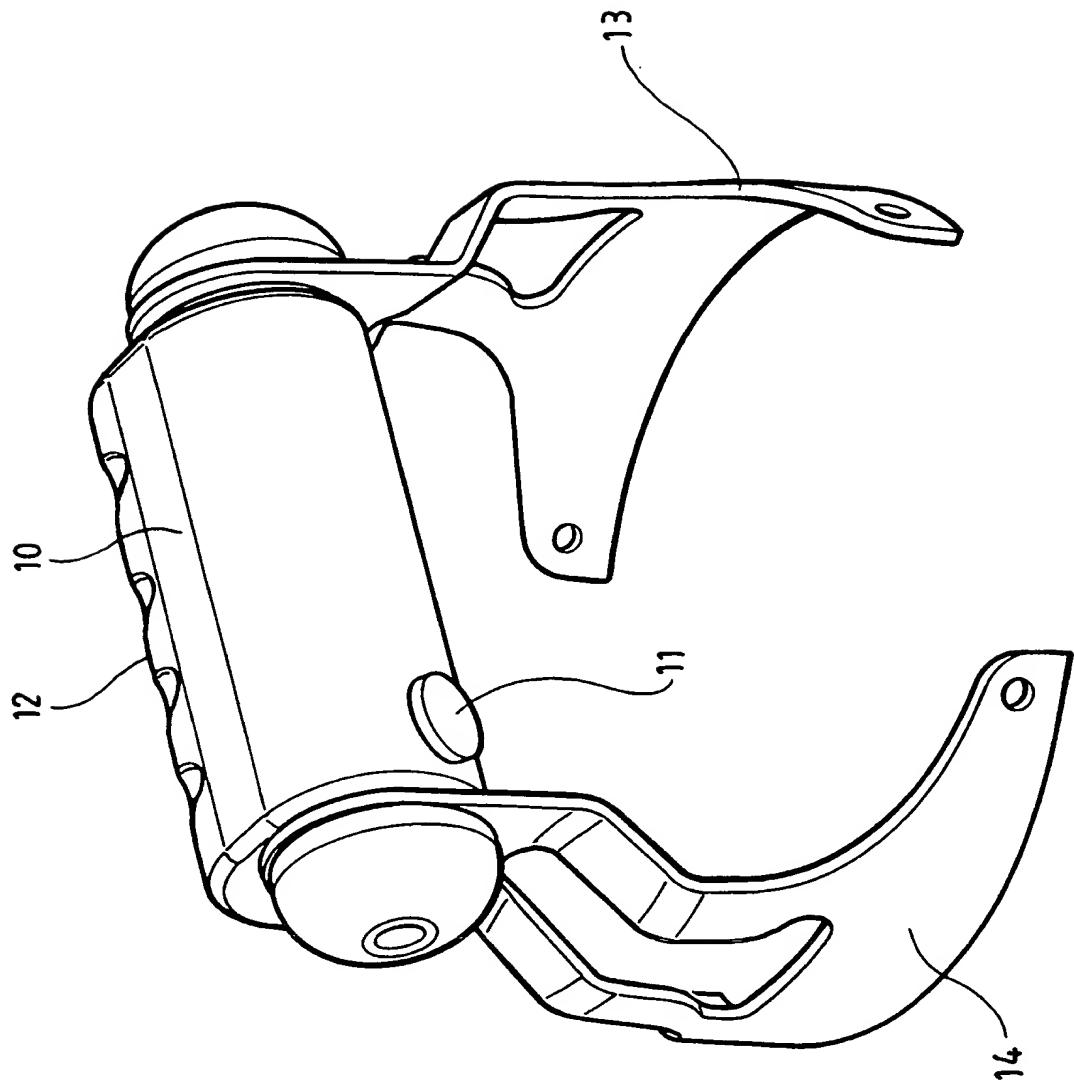
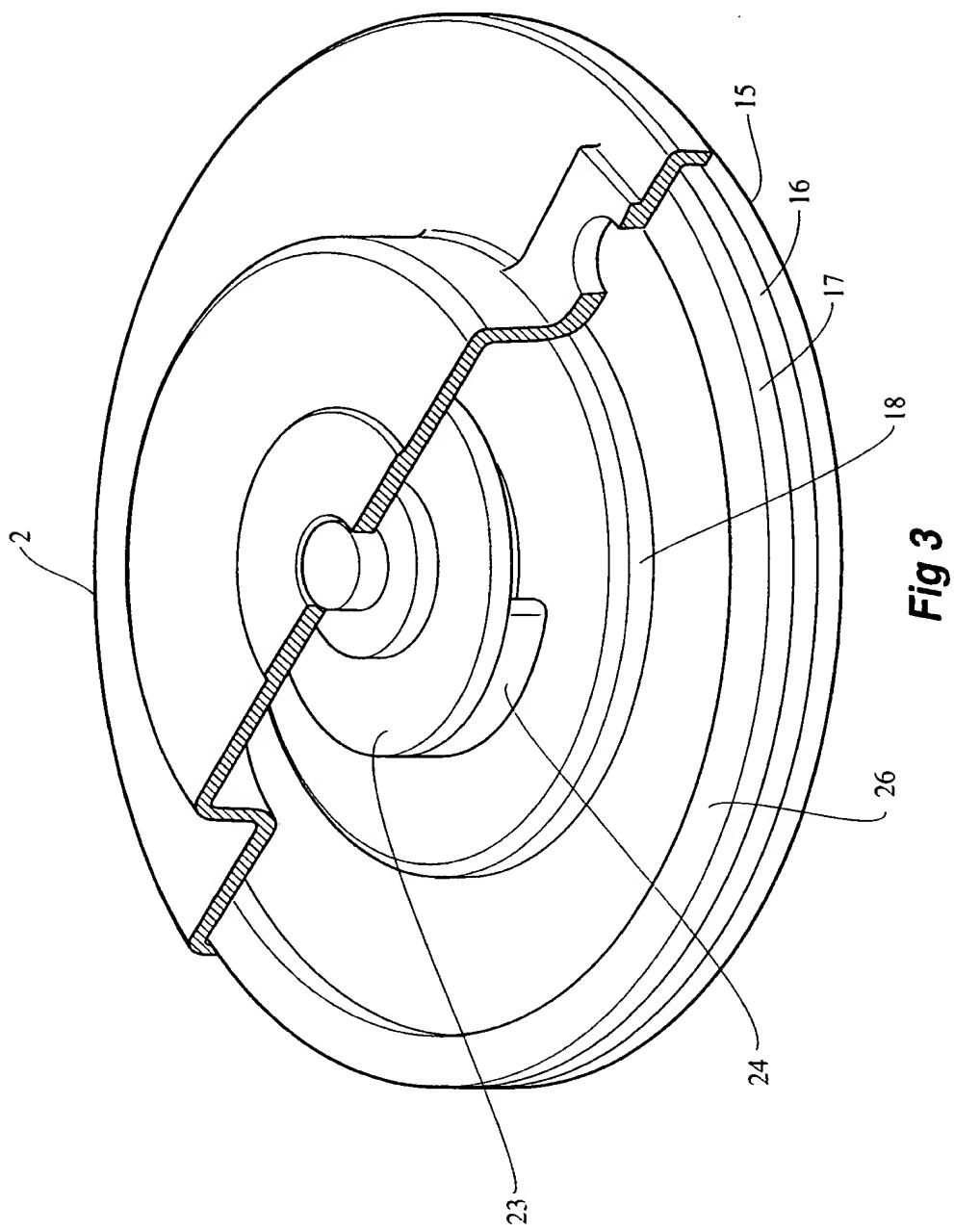


FIG 2



**Fig 3**

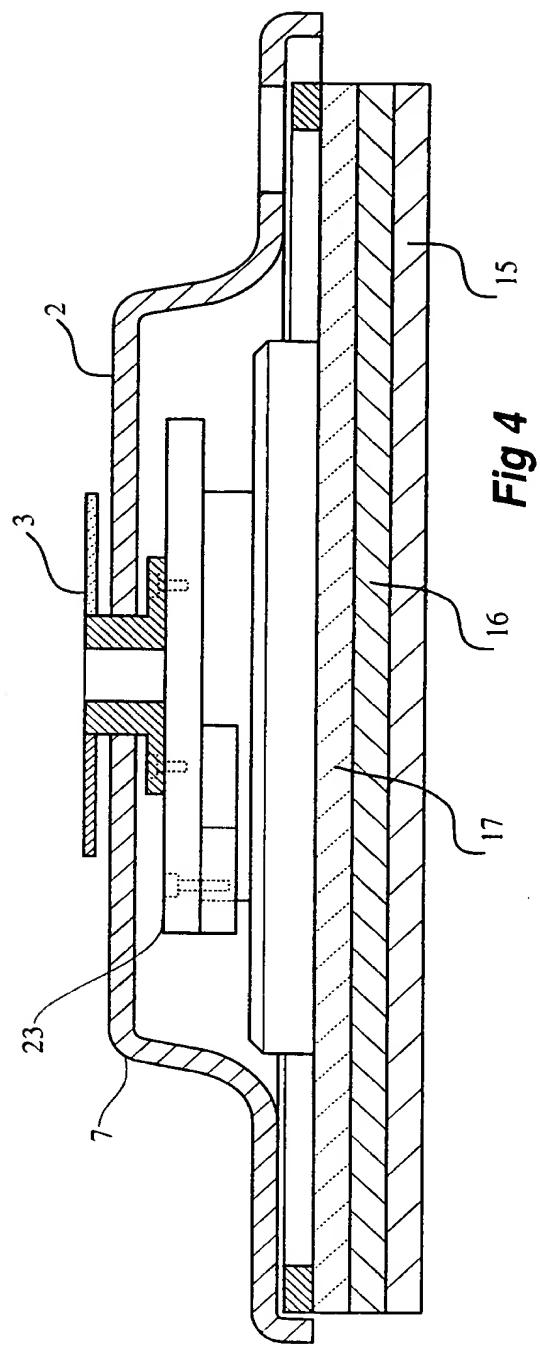


Fig 4

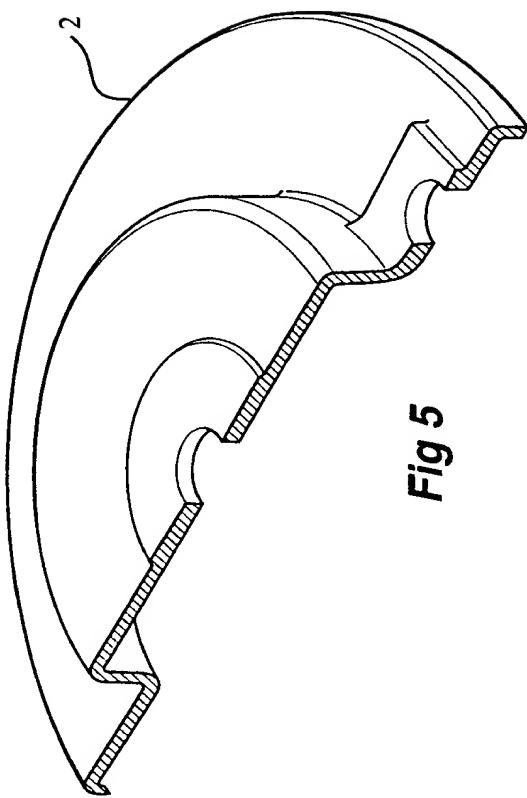
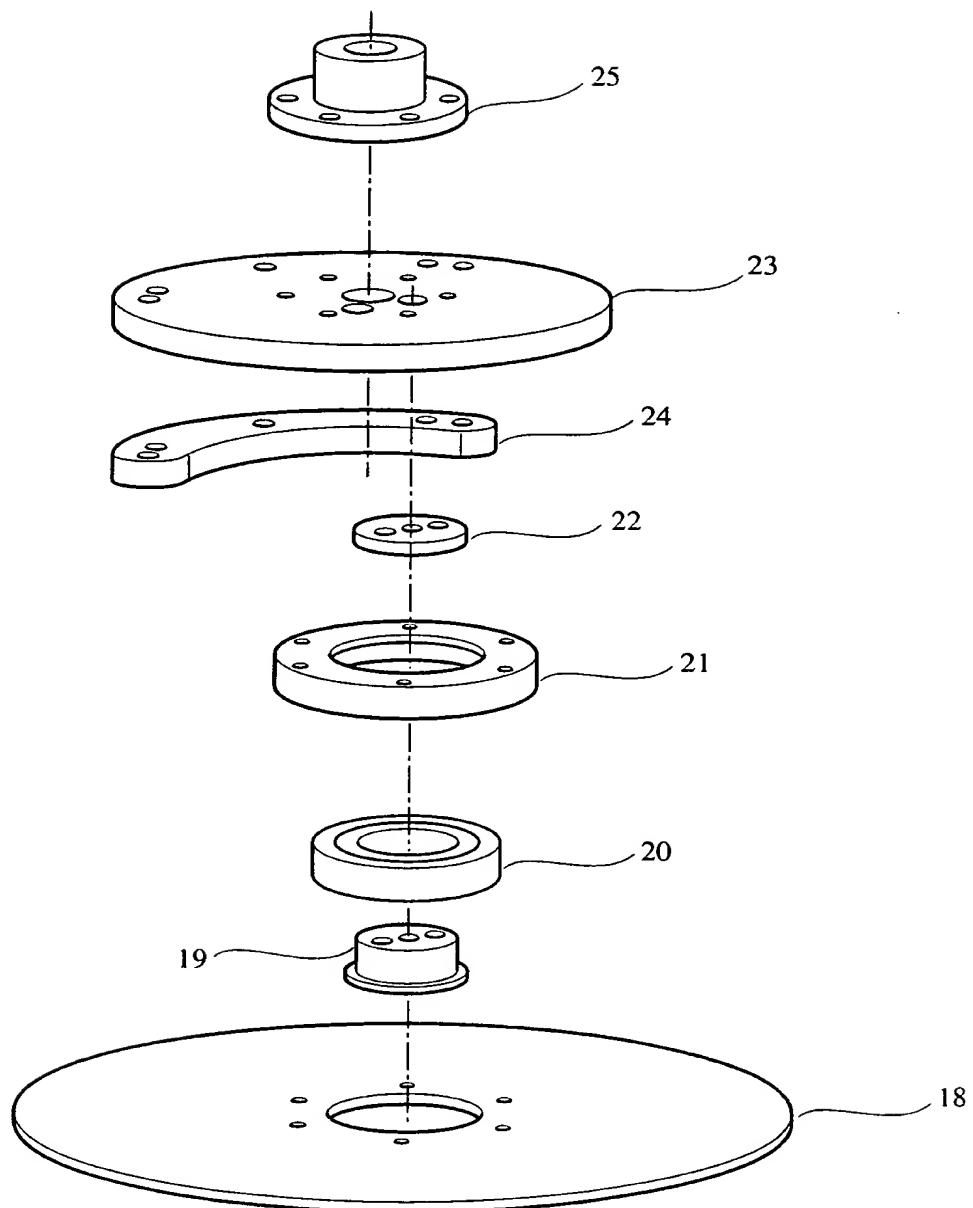
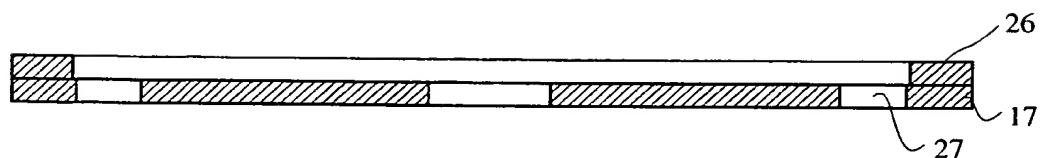
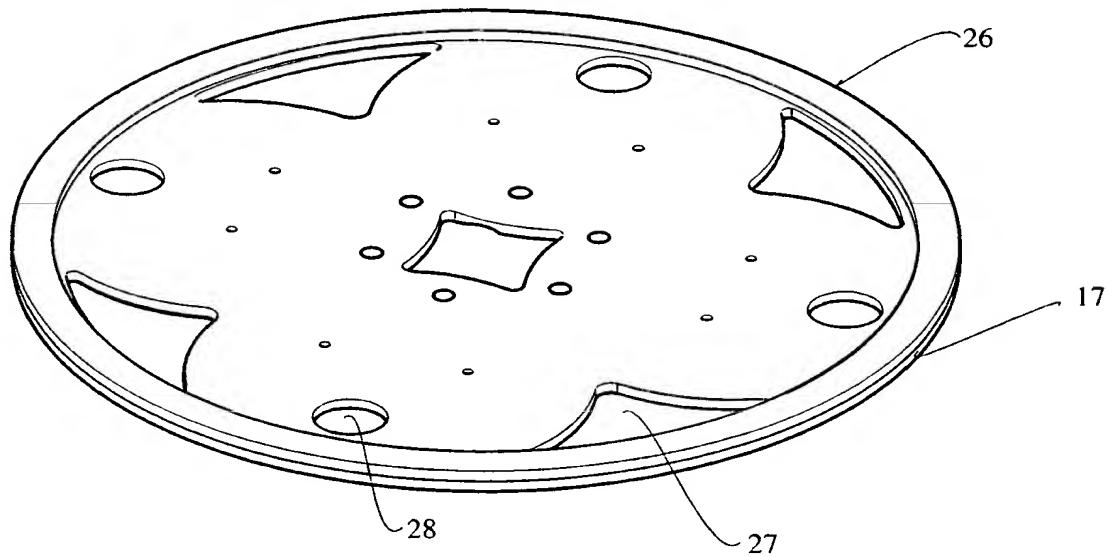


Fig 5

**FIG 6**

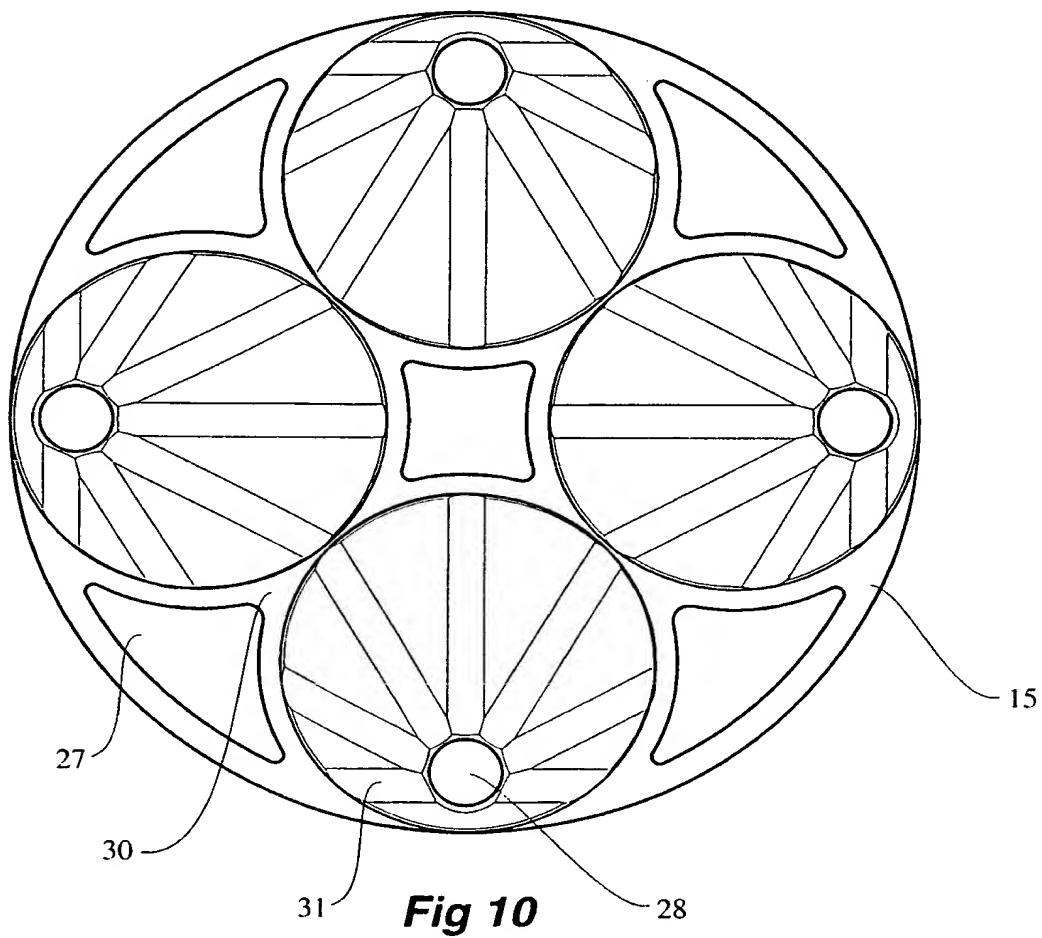
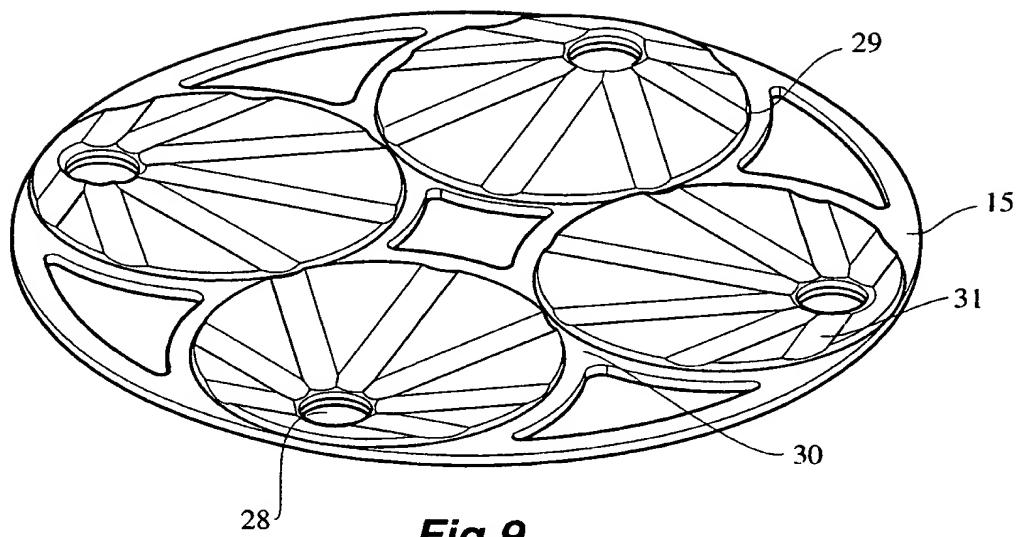


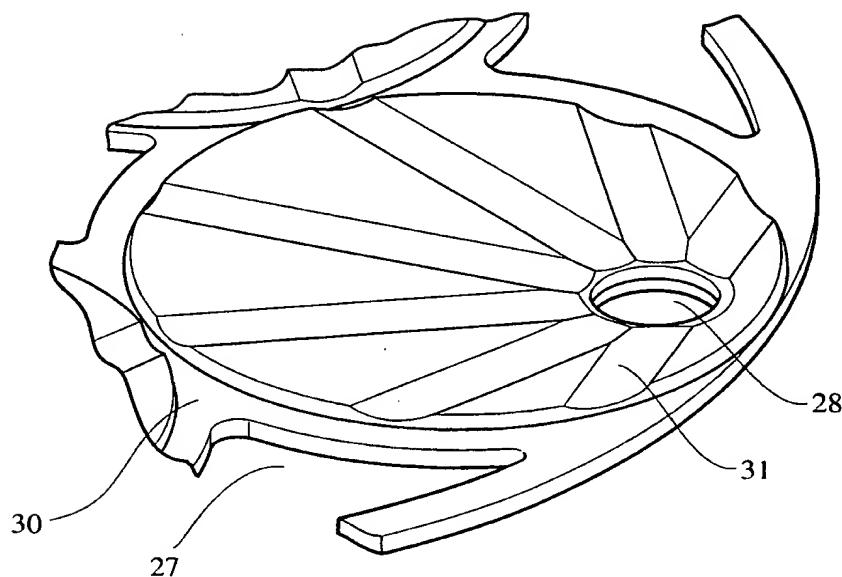
*Fig 7*



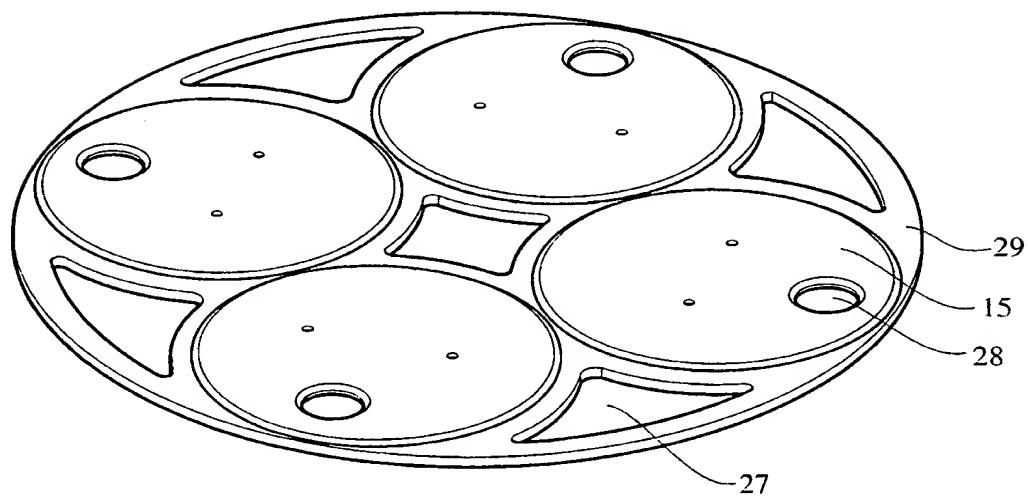
*Fig 8*

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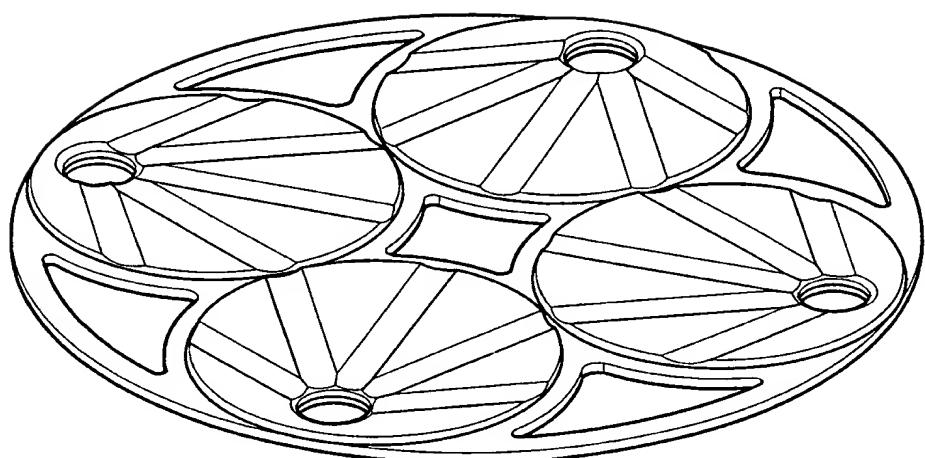


*Fig 11*

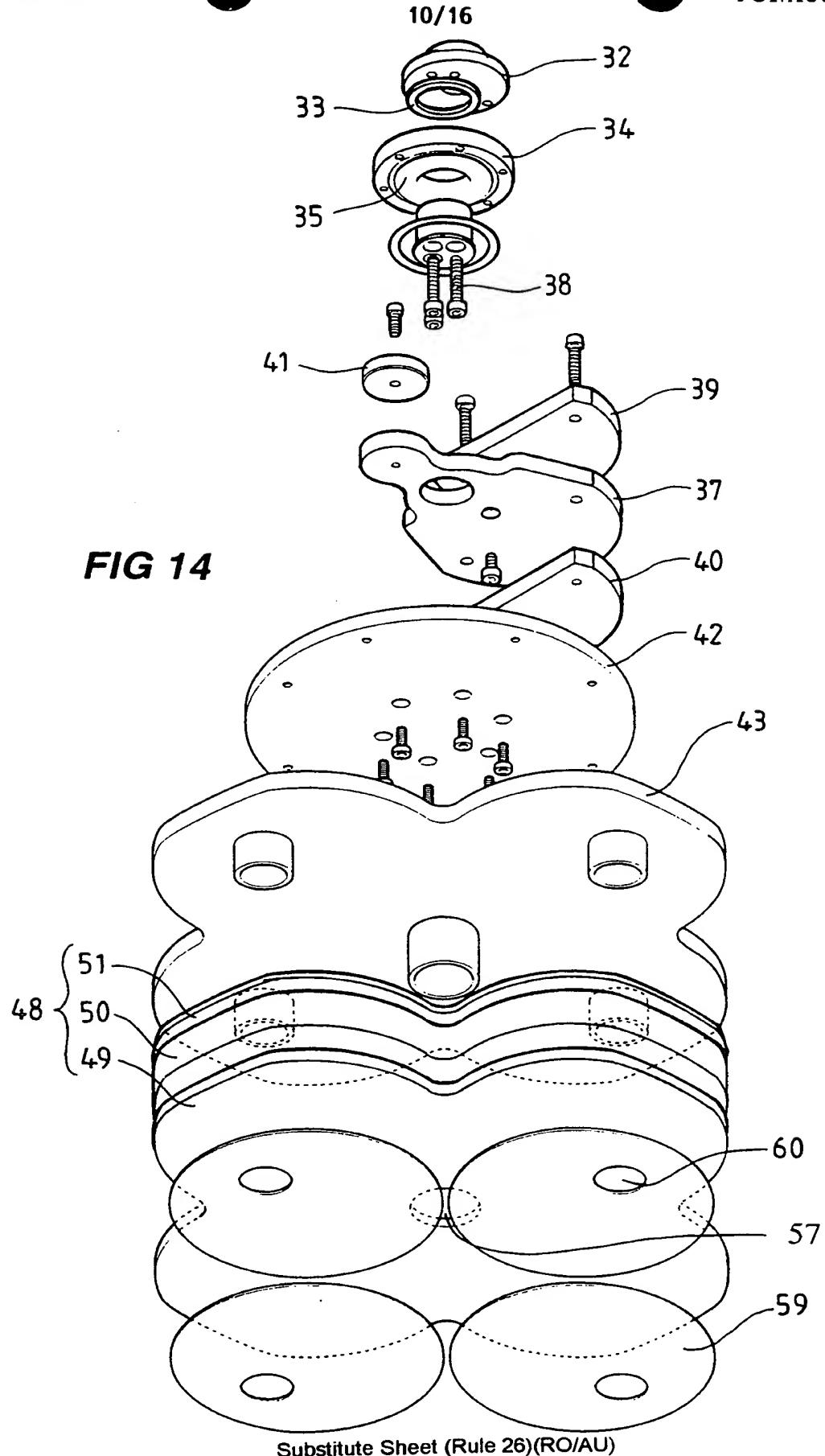


*Fig 12*

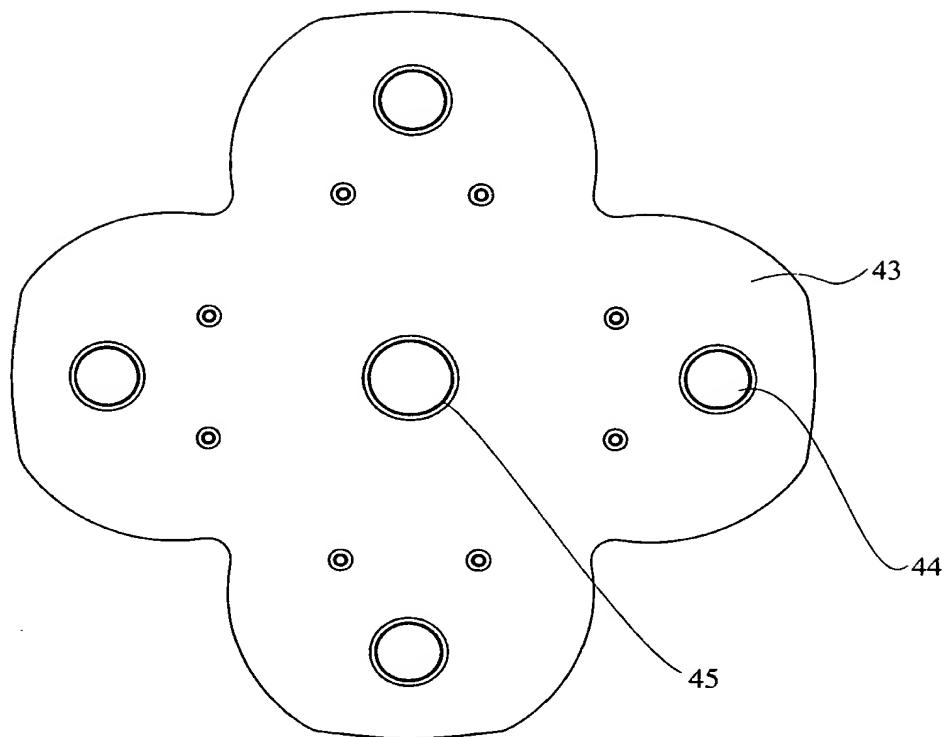
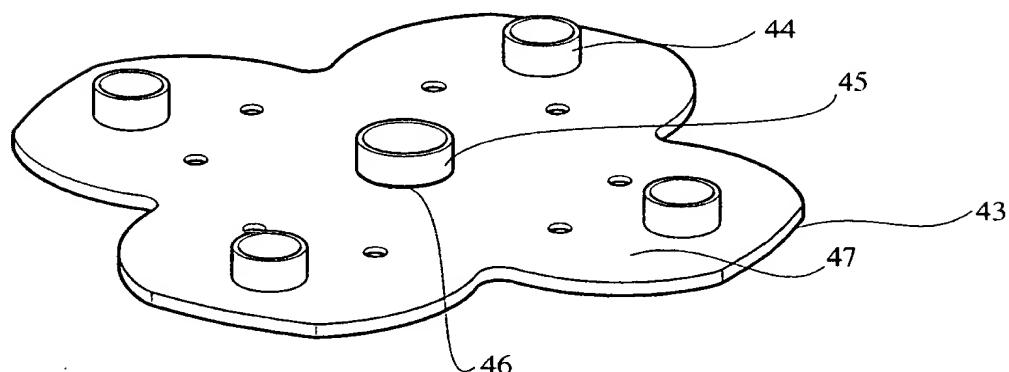
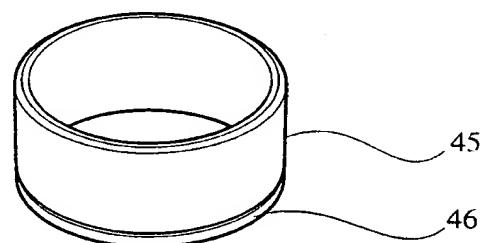
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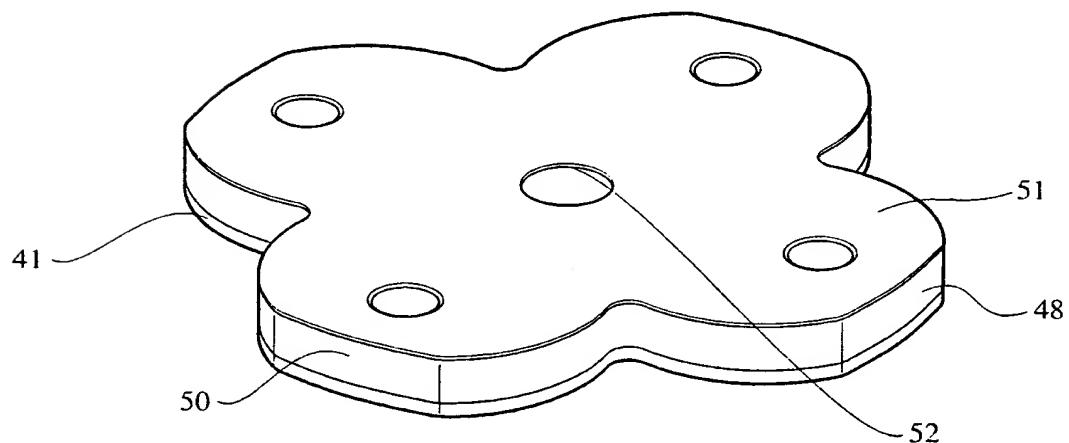
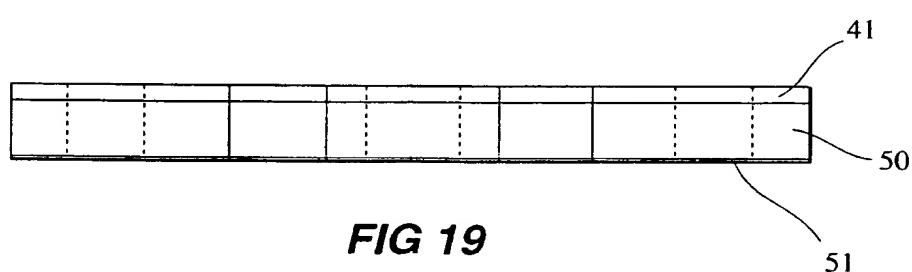
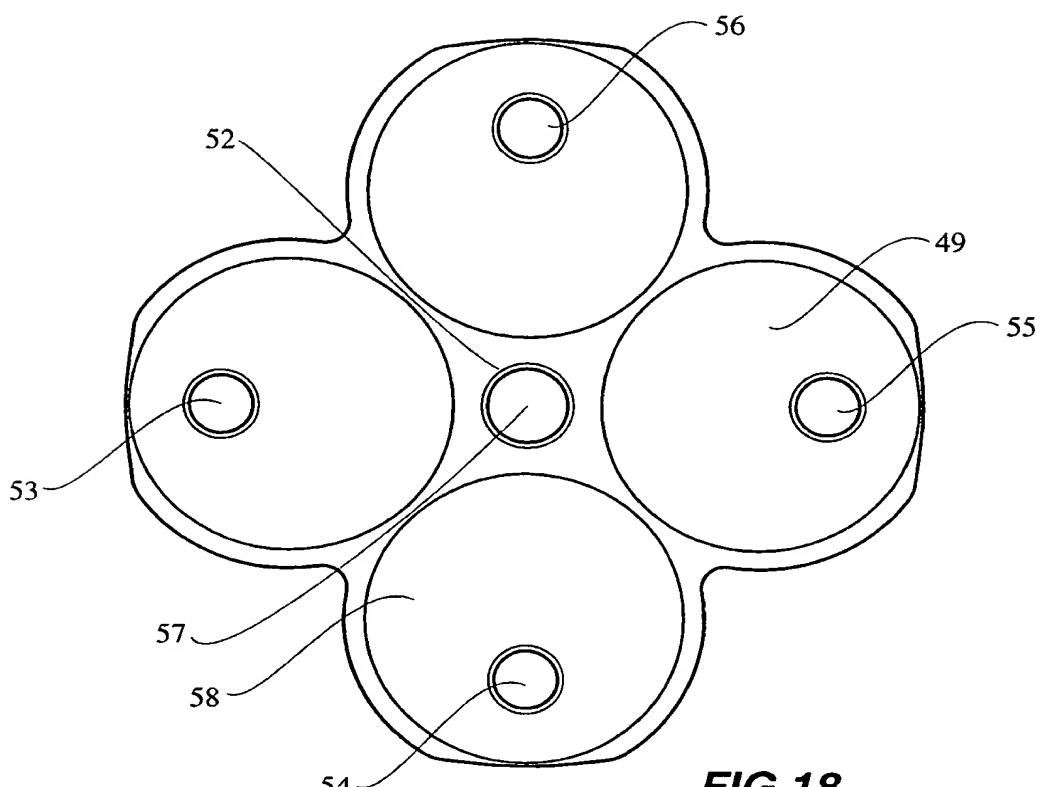


*Fig 13*

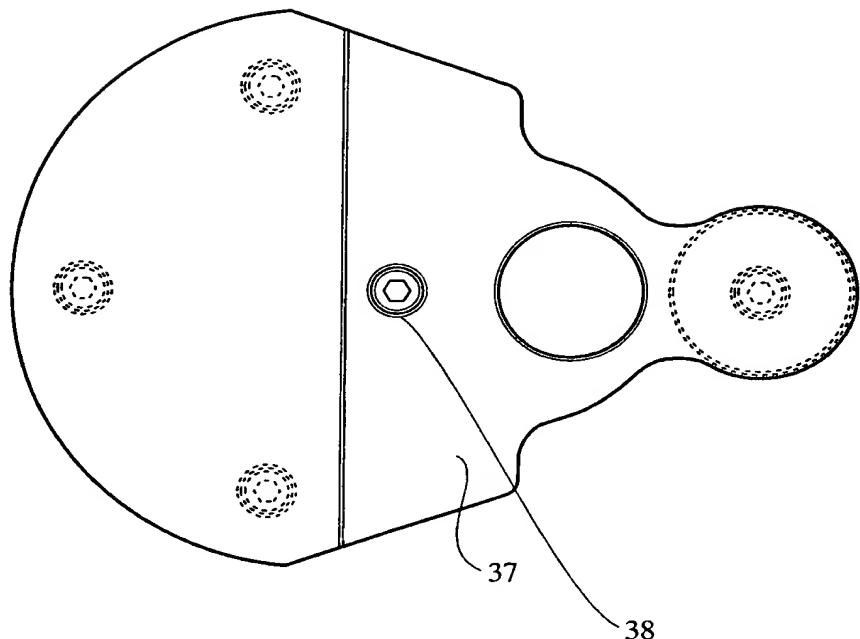
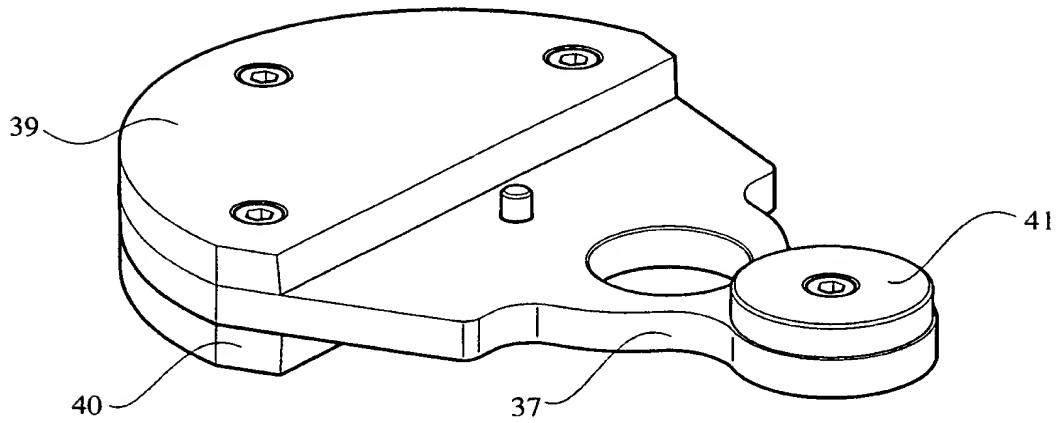


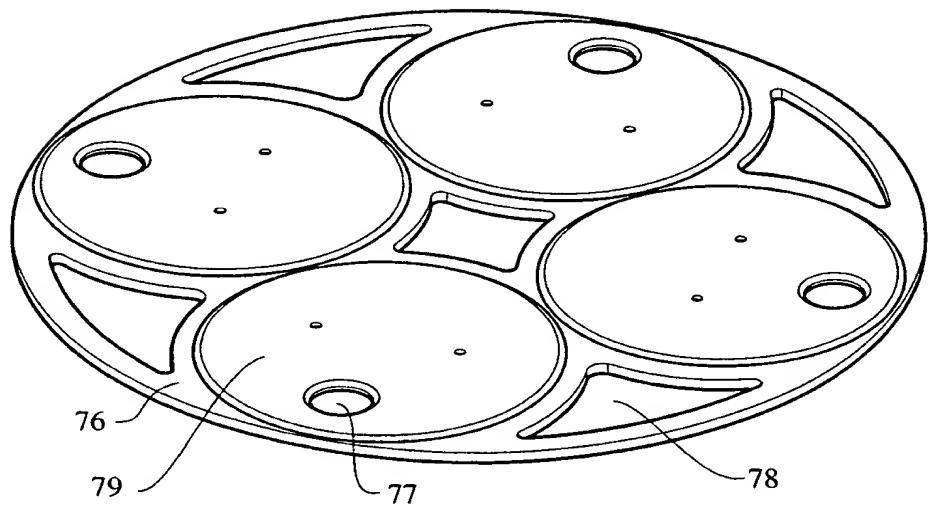
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**FIG 15****FIG 16****FIG 17**



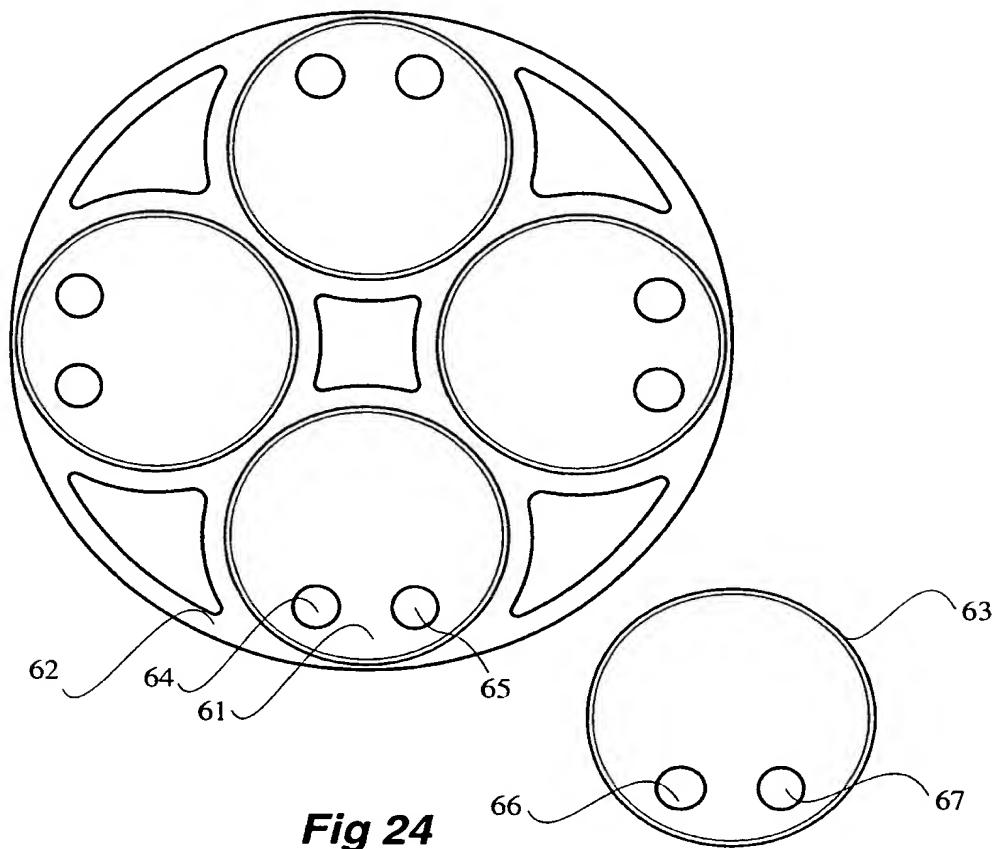
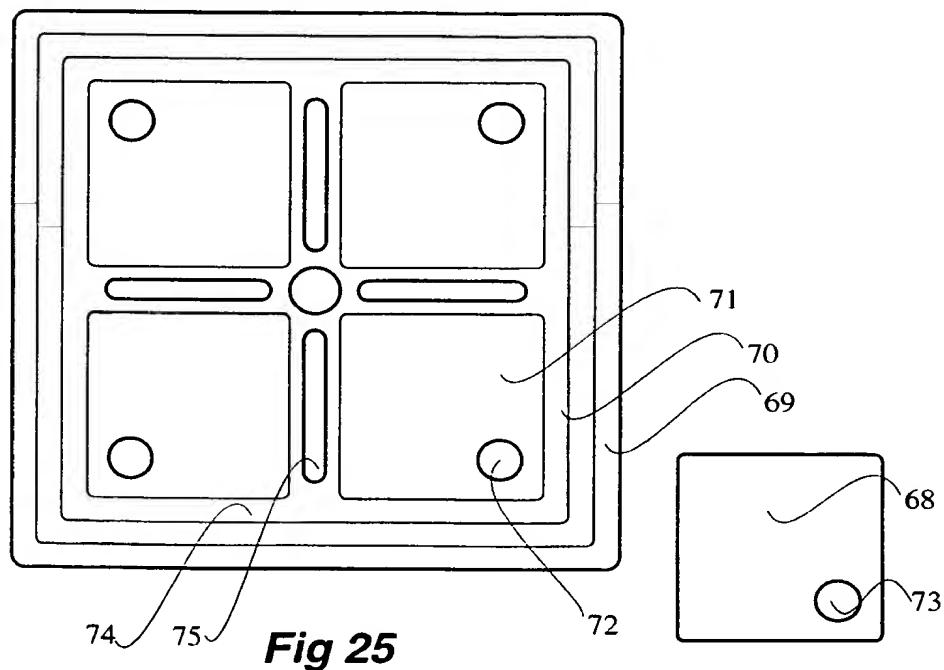
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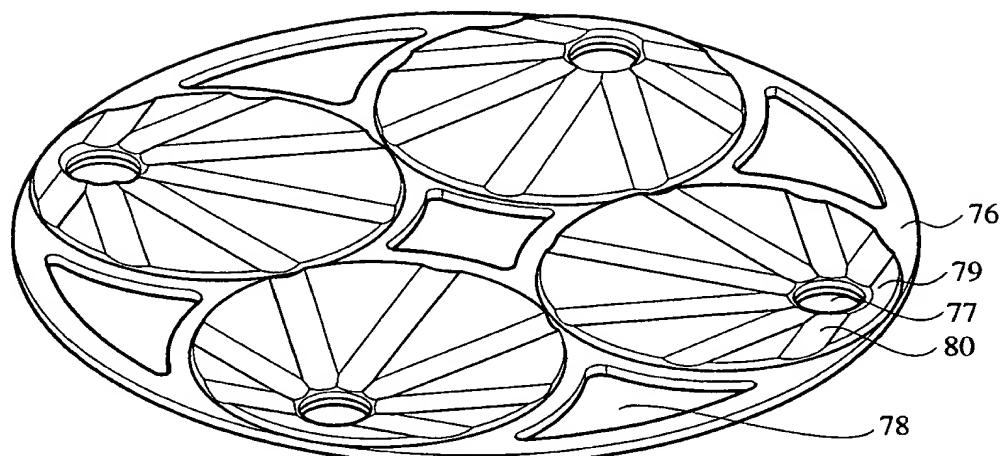
**FIG 21****FIG 22**



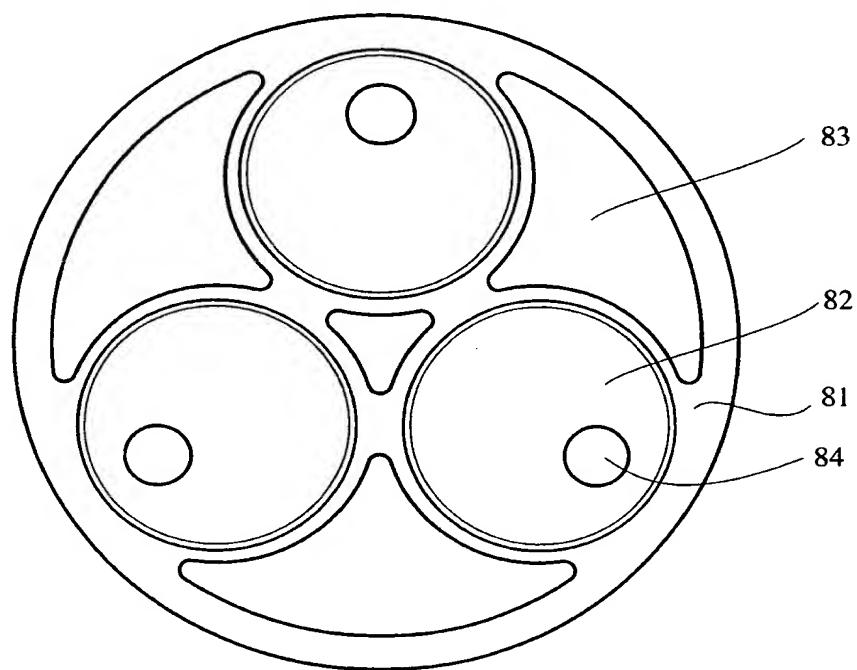
***Fig 23***

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**Fig 24****Fig 25**



**Fig 26**



**Fig 27**

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU 00/00212

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
Int Cl <sup>7</sup> : B24B 055/06, 055/10		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) IPC: B24B 055/06, 055/10		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2191429 A (ROBERT BOSCH GmbH) 16 December 1987 Figure 1	1-4,6-10
X	EP 252552 A (VALENTINI) 13 January 1988 Figure 1	1-4,6-10
X	DE 3422848 A (RYOBI LTD) 10 January 1985 Figure 1	1-4,6-10
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C		<input checked="" type="checkbox"/> See patent family annex
<p>* Special categories of cited documents:</p> <p>"A" Document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>		
Date of the actual completion of the international search 2 June 2000	Date of mailing of the international search report <b>29 JUN 2000</b>	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No.: (02) 6285 3929	Authorized officer <b>BANDULA RAJAPAKSE</b> Telephone No.: (02) 6283 2120	

**INTERNATIONAL SEARCH REPORT**International application No.  
PCT/AU 00/00212

<b>C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
<b>Category*</b>	<b>Citation of document, with indication, where appropriate, of the relevant passages</b>	<b>Relevant to claim No.</b>
X	DE 4023464 A (FESTO KG) 30 January 1992 Figures 1 and 2	1-4,6-10
X	DE 19614525 A (HITACHI KOKI CO LTD) 17 October 1996 Figure 2	1-10

## **INTERNATIONAL SEARCH REPORT**

### Information on patent family members

International application No.  
PCT/AU 00/00212

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
GB	2191429	DE	3620136	IT	8720857	JP	62297066
		US	4729195				
EP	252552		NONE				
DE	3422848		NONE				
DE	4023464		NONE				
DE	19614525	JP	8281546				

**END OF ANNEX**

PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum)

1680 PCT

## Box No. I TITLE OF INVENTION

SURFACE FINISHING MACHINE

## Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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21 SHEPHERD STREET  
RIDGEHAVEN SA 5097  
AUSTRALIA

 This person is also inventor.

Telephone No.

08 8263 3412

Facsimile No.

08 8265 4673

Telex/printer No.

State (that is, country) of nationality:

AUSTRALIA

State (that is, country) of residence:

AUSTRALIA

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box for the purposes of:

## Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

McNAIR, Susan Gail  
21 SHEPHERD STREET  
RIDGEHAVEN SA 5097  
AUSTRALIA

This person is:

 applicant only applicant and inventor inventor only (If this check-box is marked, do not fill in below.)

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AUSTRALIA

State (that is, country) of residence:

AUSTRALIA

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box for the purposes of:

 Further applicants and/or (further) inventors are indicated on a continuation sheet.

## Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

 agent common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

A.P.T. PATENT AND TRADE MARK ATTORNEYS  
GPO BOX 772  
ADELAIDE SA 5001  
AUSTRALIA

Telephone No.

08 8410 5040

Facsimile No.

08 8410 5042

Telex/printer No.

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The following designations are held / made under Rule 4.9(a) (mark the applicable check-boxes; at one must be marked):

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- OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

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| <input checked="" type="checkbox"/> AL Albania .....                               | <input checked="" type="checkbox"/> LS Lesotho .....                                   |
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| <input checked="" type="checkbox"/> AT Austria .....                               | <input checked="" type="checkbox"/> LU Luxembourg .....                                |
| <input checked="" type="checkbox"/> AU Australia .....                             | <input checked="" type="checkbox"/> LV Latvia .....                                    |
| <input checked="" type="checkbox"/> AZ Azerbaijan .....                            | <input checked="" type="checkbox"/> MD Republic of Moldova .....                       |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina .....                | <input checked="" type="checkbox"/> MG Madagascar .....                                |
| <input checked="" type="checkbox"/> BB Barbados .....                              | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia ..... |
| <input checked="" type="checkbox"/> BG Bulgaria .....                              | <input checked="" type="checkbox"/> MN Mongolia .....                                  |
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| <input checked="" type="checkbox"/> CZ Czech Republic .....                        | <input checked="" type="checkbox"/> RO Romania .....                                   |
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| <input checked="" type="checkbox"/> KR Republic of Korea .....                     |  |
| <input checked="" type="checkbox"/> KZ Kazakhstan .....                            |  |
| <input checked="" type="checkbox"/> LC Saint Lucia .....                           |  |
| <input checked="" type="checkbox"/> LK Sri Lanka .....                             |  |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- CR Costa Rica DM Dominica
- MOROCCO...Tanzanier...Algeria...

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: region	international application: receiving Office
item (1)  17 March 1999	PP9267	AU		
item (2)				
item (3)				

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1)

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

#### Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used).	Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year)      Number      Country (or regional Office)		
ISA /			

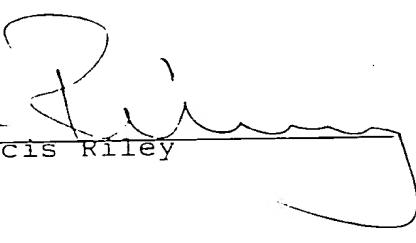
#### Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:	This international application is accompanied by the item(s) marked below:		
request : 3	1. <input checked="" type="checkbox"/> fee calculation sheet		
description (excluding sequence listing part) : 12	2. <input type="checkbox"/> separate signed power of attorney		
claims : 5	3. <input type="checkbox"/> copy of general power of attorney; reference number, if any:		
abstract : 1	4. <input type="checkbox"/> statement explaining lack of signature		
drawings : 15	5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s):		
sequence listing part of description :	6. <input type="checkbox"/> translation of international application into (language):		
Total number of sheets : 37	7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material		
	8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form		
	9. <input type="checkbox"/> other (specify):		

Figure of the drawings which should accompany the abstract: Fig. 14      Language of filing of the international application: ENGLISH

#### Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



James Francis Riley



Susan Gail McNair

For receiving Office use only		
1. Date of actual receipt of the purported international application:		2. Drawings:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		<input type="checkbox"/> received:  <input type="checkbox"/> not received:
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /		6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

PCT

FEE CALCULATION SHEET  
Annex to the Request

For receiving Office use only

International application No.

Date stamp of the receiving Office

Applicant's or agent's  
file reference

1680PCT

Applicant

JAMES FRANCIS RILEY and SUSAN GAIL MCNAIR

CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE . . . . .

100

T

800

S

2. SEARCH FEE . . . . .

International search to be carried out by \_\_\_\_\_

(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)

3. INTERNATIONAL FEE

Basic Fee

The international application contains 37 sheets.

first 30 sheets . . . . . 665 b1

7 x                    = 105 b2

remaining sheets      additional amount

Add amounts entered at b1 and b2 and enter total at B . . . . . 770 B

Designation Fees

The international application contains all designations.

                   x                    = 1152 D

number of designation fees      amount of designation fee  
payable (maximum 10)

Add amounts entered at B and D and enter total at I . . . . . 1922 I

(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 25% of the sum of the amounts entered at B and D.)

4. FEE FOR PRIORITY DOCUMENT (if applicable) . . . . . 30 P

5. TOTAL FEES PAYABLE . . . . . S 2852

Add amounts entered at T, S, I and P, and enter total in the TOTAL box

TOTAL

The designation fees are not paid at this time.

MODE OF PAYMENT

authorization to charge  
deposit account (see below)

bank draft

coupons

cheque

cash

other (specify):

postal money order

revenue stamps

DEPOSIT ACCOUNT AUTHORIZATION (this mode of payment may not be available at all receiving Offices)

The RO/  is hereby authorized to charge the total fees indicated above to my deposit account.

(this check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

Deposit Account No.

Date (day/month/year)

Signature

## PATENT COOPERATION TREATY

PCT

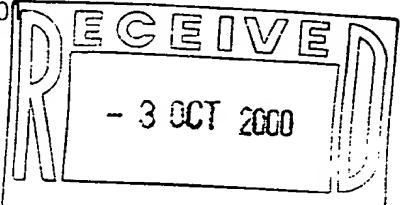
## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

A.P.T. PATENT AND TRADE MARK  
ATTORNEYS  
G.P.O. Box 772  
Adelaide, S.A. 5000  
AUSTRALIE



Date of mailing (day/month/year)
21 September 2000 (21.09.00)

Applicant's or agent's file reference
1680PCT

## IMPORTANT NOTICE

International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/AU00/00212	17 March 2000 (17.03.00)	17 March 1999 (17.03.99)
Applicant RILEY, James, Francis et al		

- Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AG,AU,DZ,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

- The following designated Offices have waived the requirement for such a communication at this time:  
AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,  
GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,  
NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW  
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).
- Enclosed with this Notice is a copy of the international application as published by the International Bureau on  
21 September 2000 (21.09.00) under No. WO 00/54936

## REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

## REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 740.14.35	Authorized officer  J. Zahra  Telephone No. (41-22) 338.83.38
--	---

## PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

To:

A.P.T. PATENT AND TRADE MARK  
ATTORNEYS  
G.P.O. Box 772  
Adelaide, S.A. 5001  
AUSTRALIE

Date of mailing (day/month/year)  
25 October 2000 (25.10.00)

Applicant's or agent's file reference  
1680PCT

## IMPORTANT INFORMATION

International application No.  
PCT/AU00/00212

International filing date (day/month/year)  
17 March 2000 (17.03.00)

Priority date (day/month/year)  
17 March 1999 (17.03.99)

Applicant

RILEY, James, Francis et al

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

AP :GH,GM,KE,LS,MW,SD,SL,SZ,TZ,UG,ZW

EP :AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE

National :AG,AU,BG,CA,CN,CZ,DE,DZ,IL,JP,KP,KR,MN,NO,NZ,PL,RO,RU,SE,SK,US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA :AM,AZ,BY,KG,KZ,MD,RU,TJ,TM

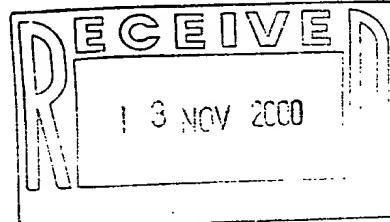
OA :BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG

National :AE,AL,AM,AT,AZ,BA,BB,BR,BY,CH,CR,CU,DK,DM,EE,ES,FI,GB,GD,GE,GH,  
GM,HR,HU,ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MW,MX,PT,SD,  
SG,SI,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.



The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

Manu Berrod

Telephone No. (41-22) 338.83.38

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 1680PCT: PJW:JWH:HJB	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).	
International Application No. PCT/AU00/00212	International Filing Date ( <i>day/month/year</i> ) 17 March 2000	Priority Date ( <i>day/month/year</i> ) 17 March 1999	
International Patent Classification (IPC) or national classification and IPC Int. Cl. 7 B24B 055/06, 055/10			
Applicant RILEY, James Francis et al			

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.		
2.	This REPORT consists of a total of 3 sheets, including this cover sheet.  <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of sheet(s).		
3.	This report contains indications relating to the following items:		
I	<input checked="" type="checkbox"/> Basis of the report		
II	<input type="checkbox"/> Priority		
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability		
IV	<input type="checkbox"/> Lack of unity of invention		
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
VI	<input type="checkbox"/> Certain documents cited		
VII	<input type="checkbox"/> Certain defects in the international application		
VIII	<input type="checkbox"/> Certain observations on the international application		

Date of submission of the demand 16 October 2000	Date of completion of the report 28 May 2001
Name and mailing address of the IPEA AU  AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>BANDULA RAJAPAKSE</b> Telephone No. (02) 6283 2120

## I. Basis of the report

1. With regard to the elements of the international application:\*

- the international application as originally filed.
- the description.      pages 1-12, as originally filed.  
                              pages , filed with the demand.  
                              pages , received on with the letter of  
 the claims.      pages , as originally filed.  
                              pages , as amended (together with any statement) under Article 19.  
                              pages , filed with the demand,  
                              pages 13-16, received on 2 March 2001 with the letter of 1 March 2001
- the drawings.      pages 1/16-16/16, as originally filed,  
                              pages , filed with the demand,  
                              pages , received on with the letter of  
 the sequence listing part of the description:  
                              pages , as originally filed  
                              pages , filed with the demand  
                              pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).  
 the language of publication of the international application (under Rule 48.3(b)).  
 the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:

- contained in the international application in written form.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority in written form.  
 furnished subsequently to this Authority in computer readable form.  
 The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
 The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4.  The amendments have resulted in the cancellation of:

- the description.      pages  
 the claims.          Nos.  
 the drawings.        sheets fig.

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

AU00/00212

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 1-31	YES
	Claims	NO
Inventive step (IS)	Claims 1-31	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-31	YES
	Claims	NO

## 2. Citations and explanations (Rule 70.7)

The proposed amendments and new claims clearly define a mounting plate for a surface finishing machine. The mounting plate having at least one vacuum port, a plurality of mounting areas proud of an intervening web and adapted to have mounted thereto surface finishing pads, and the mounting plate being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum port or vacuum ports by vacuum dust extraction means.

No individual citation or obvious combination of citations disclose the above. The subject matter of claims 1-31 therefore is new, involves an inventive step and is industrially applicable. (Articles 33(2), 33(3) & 33(4).

## PATENT COOPERATION TREATY

PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 29 JUN 2001  
WIPO PCT

Applicant's or agent's file reference 1680PCT: PJW:JWH:HJB	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/AU00/00212</b>	International Filing Date ( <i>day/month/year</i> ) <b>17 March 2000</b>	Priority Date ( <i>day/month/year</i> ) <b>17 March 1999</b>
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl. <sup>7</sup> B24B 055/06, 055/10</b>		
Applicant <b>RILEY, James Francis et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

- I  Basis of the report
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

Date of submission of the demand <b>16 October 2000</b>	Date of completion of the report <b>28 May 2001</b>
Name and mailing address of the IPEA/AU <b>AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929</b>	Authorized Officer <b>BANDULA RAJAPAKSE</b> <b>Telephone No. (02) 6283 2120</b>

**I. Basis of the report**

## 1. With regard to the elements of the international application:\*

- the international application as originally filed.
- the description, pages 1-12, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of  
                  pages , as originally filed,  
                  pages , as amended (together with any statement) under Article 19,  
                  pages , filed with the demand,  
                  pages 13-16, received on 2 March 2001 with the letter of 1 March 2001
- the drawings, pages 1/16-16/16, as originally filed,  
                  pages , filed with the demand,  
                  pages , received on with the letter of  
 the sequence listing part of the description:  
                  pages , as originally filed  
                  pages , filed with the demand  
                  pages , received on with the letter of

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).  
 the language of publication of the international application (under Rule 48.3(b)).  
 the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:

- contained in the international application in written form.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority in written form.  
 furnished subsequently to this Authority in computer readable form.  
 The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
 The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4.  The amendments have resulted in the cancellation of:

- the description, pages  
 the claims, Nos.  
 the drawings, sheets/fig.

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 1-31	YES
	Claims	NO
Inventive step (IS)	Claims 1-31	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-31	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

The proposed amendments and new claims clearly define a mounting plate for a surface finishing machine. The mounting plate having at least one vacuum port, a plurality of mounting areas proud of an intervening web and adapted to have mounted thereto surface finishing pads, and the mounting plate being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum part or vacuum ports by vacuum dust extraction means.

No individual citation or obvious combination of citations disclose the above. The subject matter of claims 1-31 therefore is new, involves an inventive step and is industrially applicable. (Articles 33(2), 33(3) & 33(4)).

CLAIMS

1. A mounting plate as hereinbefore described for a surface finishing machine, the mounting plate including at least one vacuum port, a plurality of mounting areas proud of an intervening web and adapted to have mounted thereto surface finishing pads, and the mounting plate being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum port or vacuum ports by vacuum dust extraction means.
- 5 2. A mounting plate as in claim 1 wherein the vacuum port or at least one of the vacuum ports is within the web.
- 10 3. A mounting plate as in claim 1 wherein the vacuum port or at least one of the vacuum ports is within a one of the mounting areas.
4. A mounting plate as in claim 1 wherein the mounting areas are integral with the web.
- 15 5. A mounting plate as in claim 1 wherein the mounting areas are formed separately to the web and are fitted thereto so that the mounting areas are proud of the web.
6. A mounting plate as in any one of claims 1 to 5 inclusive being adapted to be driven by a random orbital means.
- 20 7. A mounting plate as in any one of claims 1 to 6 inclusive wherein the centre of the mounting plate is part of the web.
8. A mounting plate as in claim 7 wherein the mounting areas are radially spaced about the centre of the mounting plate.
9. A mounting plate as in claim 8 including at least three mounting areas.
10. A mounting plate as in claim 9 including four mounting areas.
- 25 11. A mounting plate as in any one of claims 7 to 10 inclusive including a plurality of vacuum ports, at least one vacuum port being through the web and proximal to the centre of the mounting plate, and other vacuum ports being through the web and proximal to the periphery of the mounting plate.
- 30 12. A mounting plate as in any one of claims 7 to 11 inclusive including a plurality of vacuum ports, at least one vacuum port being through each mounting

area being adapted to align with a dust extraction aperture of a surface finishing pad.

13. A mounting plate as in claim 12 wherein the mounting areas are circular and the vacuum port of each mounting area being between the centre of the respective mounting area and the periphery of the respective mounting area distal the centre of the mounting plate.  
5
14. A mounting plate as in any one of claims 1 to 13 inclusive wherein each mounting area has at least one channel therein adapted to direct dust to the vacuum port or a one of the vacuum ports through the respective mounting area.  
10
15. A mounting plate as in any one of claims 1 to 14 inclusive wherein the mounting areas are circular and of diameter less than or equal to 373 mm.  
16. A mounting plate as in any one of claims 1 to 15 inclusive including hook and loop means adapted for attaching a surface finishing pad to each mounting area on the mounting plate.  
15
17. A mounting plate as in any one of claims 1 to 16 inclusive comprising a plurality of layers between an external surface upon which the mounting areas lie and a rear surface, and the mounting plate including a first layer including the mounting areas made of urethane and a second layer of resilient material.  
18. A mounting plate as in any one of claims 1 to 17 inclusive wherein the 20 vacuum port or at least one of the vacuum ports fits over a hollow cylindrical dust extraction peg, the dust extraction peg having an external circumferential groove, and the mounting plate including a thin backing plate with a peg aperture of diameter slightly smaller than the external diameter of the peg and adapted to receive the dust extraction peg, and the thickness and resiliency of the backing plate being such that the mounting plate may be pushed onto and pulled off the dust extraction peg and when secured relative to the dust extraction peg the 25 backing plate resides within the groove.  
19. A surface finishing pad including the mounting plate of claim 1 and a surface finishing disc mounted to each mounting area, the surface finishing disc suitable for sanding, burnishing or polishing a surface.  
30  
20. A surface finishing machine including  
a mounting plate as hereinbefore described and having at least one vacuum port, a plurality of mounting areas proud of an intervening web and adapted to

have mounted thereto surface finishing pads, and the mounting plate being adapted such that dust tends to progress into the proximity of the web and may therefrom be extracted through the vacuum port or vacuum ports by vacuum dust extraction means,

5 and random orbital drive means adapted to drive the mounting plate.

21. A surface finishing machine as in claim 20 wherein the mounting areas are formed separately to the web and are fitted thereto so that the mounting areas are proud of the web.

10 22. A surface finishing machine as in either claim 20 or 21 including vacuum dust extraction means adapted to facilitate vacuum dust extraction through respective vacuum ports on the mounting plate.

15 23. A surface finishing machine as is claim 22 wherein the dust extraction means includes at least one vacuum aperture adapted to align with at least one vacuum port of the mounting plate, and vacuum connection means connecting the aperture to a vacuum source.

24. A surface finishing machine as is claim 23 including dust collection means for the collection of the extracted dust.

20 25. A surface finishing machine as in claim 23 wherein the vacuum connection means includes at least one hollow cylindrical dust extraction peg, the dust extraction peg adapted to align with at least one vacuum port of the mounting plate, the mounting plate including a thin backing plate with a peg aperture of diameter slightly smaller than the external diameter of the peg and adapted to receive the dust extraction peg, and the thickness and resiliency of the backing plate being such that the mounting plate may be pushed onto and pulled off the dust extraction peg and when secured relative to the dust extraction peg the backing plate resides within an external circumferential groove on the peg.

25 26. A surface finishing machine as in either claim 20 or 25 including a base plate connected to the random orbital drive means and adapted to receive the mounting plate.

30 27. A surface finishing machine as in claim 25 wherein the at least one peg is attached to an intermediate disc onto which the mounting plate is fitted.

28. A surface finishing machine as in claim 27 wherein the random orbital means includes at least one eccentrically driven weight, and the base plate is

connected off centre with respect to said weight to thereby result in a random orbital motion of the base plate.

29. A surface finishing machine as in claim 28 including a chassis which shrouds the base and mounting plates and has a downwardly open aperture for exposing the mounting plate and surface finishing pad connected thereto to a surface to be finished.
- 5 30. A surface finishing machine as in claim 29 wherein the chassis also includes a flexible skirt extending from a lower edge of the chassis, the flexible skirt adapted to form a partial vacuum seal with a surface during operation.
- 10 31. A surface finishing machine as in claim 30 wherein at least one of the vacuum ports is a gap between the periphery of the mounting plate and the chassis.